# CHAPTER I

INTRODUCTION

One of the main problems of the present-day is an increasing rate of power consumption. Electrical power is a perfect kind of energy in that it can be easily and efficiently transferred, and converted into other forms of the energy. However, generation of electrical energy by traditional means of burning fossil at power stations is accompanied by the exhaust that contaminates the environment. The exhaust of traditional sources of energy such as coal, oil, gas, reduces their usefulness. The most attractive way to meet the increasing energy demands is to use renewable energy sources, primarily the solar energy.

Sunlight is practically an inexhaustible energy source. It falls upon all parts of the earth. The sunlight spectrum is closed to the spectrum of a perfect blackbody heated up to approximately 5800 K, which far exceeds the environment temperature at which the sunlight is used (~300 K). Sunlight is an ecologically pure and accessible energy source possessing a high-energy potential.

Figure 1.1 shows solar radiation around the world on January and April in 1984-1993. Thailand situates near the equator with a high level of insolation is utilised for solar thermal.

The cost of energy imports of Thailand rapidly increases from 314 thousand million Bath in 2000 to 516 thousand million Bath in 2004, while that of energy exports is nearly constant.
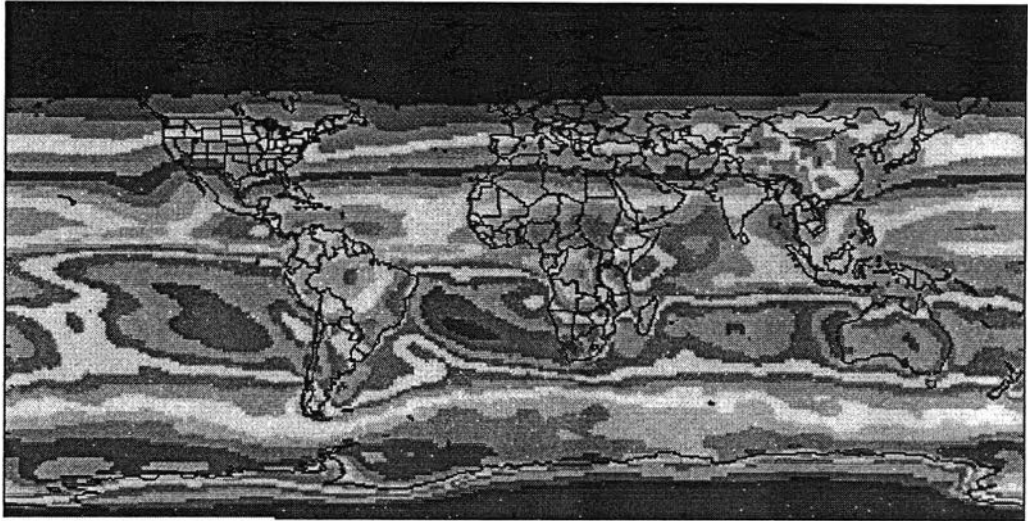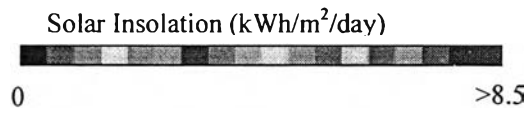
January 1984-1993

April 1984-1993

Solar Insolation (kWh/m^2/day)

0   >8.5

Figure 1.1: Measuring solar insolation [1].

Table 1.1 Energy imports and exports of Thailand in 2000-2004 [2]

ITEM	2000	2001	2002	2003	2004
1. ENERGY IMPORTS	314	331	336	407	561
PETROLEAM	305	318	324	394	543
COAL& ITS PRODUCTS	5	8	8	9	12
ELECTRICITY	4	5	4	4	6
NEW& RENEWABLE ENERGY	0	0	0	0	0
2. ENERGY EXPORTS	68	65	70	78	110
PETROLEAM	67	64	69	77	109
ELECTRICITY	1	1	1	1	1
NEW& RENEWABLE ENERGY	0	0	0	0	0
NET ENERGY IMPORTS	246	266	266	329	451

Note   unit: thousand million Bath

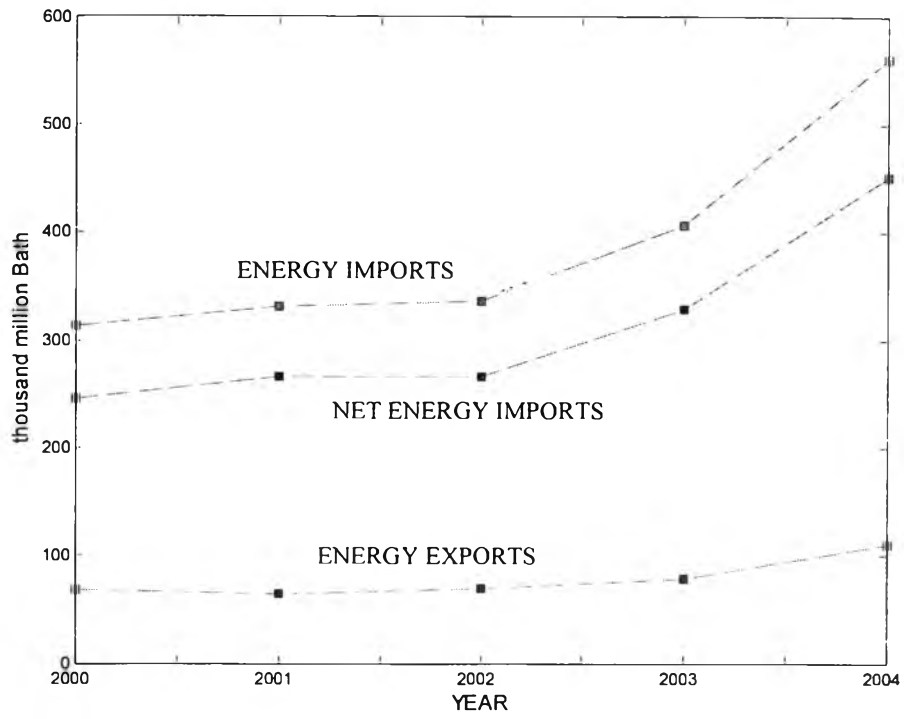Data shown as '0' means figure is less than 0.5

Figure 1.2: Relation of energy imports and exports of Thailand in 2000-2004 [2]